Contents

Preface vii

Conference organization ix

Sponsors x

THIN FILM GROWTH

Thin-film growth and structure for solid-state batteries
C. Julien and M. Balkanski 1

Epitaxial TiO_2 and VO_2 films prepared by MOCVD
H.L.M. Chang, H. You, J. Guo and D.J. Lam 12

Gas jet deposition of thin films
B.L. Halpern, J.J. Schmitt, J.W. Golz, Y. Di and D.L. Johnson 19

Homo- and hetero-iodide thin film growth on InSb(001): low-temperature iodide formation and epitaxial growth of CdI_2
A. Mowbray and R.G. Jones 27

A molecular dynamics study of the critical thickness of Ge layers on Si substrates
P. Ashu and C.C. Matthai 39

Growth modes of overlayers of Se deposited on Cu(111) surfaces
S. Nagashima, E. Fukuchi and I. Ogura 44

Growth mechanisms of diamond-like films formed by laser ablation of graphite
E.B.D. Bourdon and R.H. Prince 50

Coloration of Sn–Sb–O thin films
Y. Nakanishi, Y. Suzuki, T. Nakamura, Y. Hatanaka, Y. Fukuda, A. Fujisawa and G. Shimaoka 55

Properties of noble metal and binary alloy monolayer films on Ru(001)
K. Kalki, B. Pennemann, U. Schröder, W. Heichler and K. Wandelt 59

Formation of a superstructure in the initial stage of Ge epitaxial growth on Si(100) substrates
N. Ohshima, Y. Koide, S. Zaima and Y. Yasuda 69

Characterization of low-temperature MOCVD $Cd_{1-x}Mn_xTe$ thin films
G.N. Pain, T. Warminski, S. Sulcs, M.S. Kwietniak, D. Gao, S.R. Glanvill, C.J. Rossouw, A.W. Stevenson, S.P. Russo, R.G. Elliman, L.S. Wielunski, R.S. Rowe, G.B. Deacon, R.S. Dickson and B.O. West 76

Chemical molecular beam deposition of II–VI binary and ternary compound films in a gas flow
T.M. Razykov 89

Zinc oxide and oxygen overlayers on Cu(110): a model for Cu–Zn–O catalysts
S.S. Fu and G.A. Somorjai 93

Growth and characterization of silicon-nitride films by plasma-enhanced chemical vapor deposition
I.K. Han, Y.J. Lee, J.W. Jo, J.I. Lee and K.N. Kang 104

CLEAN SURFACES

Light emission from Si cleaved and gas-covered surfaces
D. Haneman and N. McAlpine 111

Alkali-metal adsorption on silicon surfaces studied by field ion-scanning tunneling microscopy (FI-STM)
T. Hashizume, Y. Hasegawa and T. Sakurai 119

Carbon monoxide oxidation on epitaxial Cu(111)/Pd(111) bilayers at atmospheric pressures
R.W. Vook and B. Oral 125

Interaction of NO and H_2 with Pt(100)
H.H. Madden and R. Imbihl 130

The role of non-adiabaticity and two-dimensional Fermi surfaces in the reconstruction of Mo(001) and W(001)
K.E. Smith, G.S. Elliott and S.D. Kevan 135

Hydrogen chemisorption on contaminated composite catalysts
T. Zhang and S.Y. Wei 139

Mechanisms of $He^*(2^1S)$ de-excitation on oxygen-adsorbed Si(100) surfaces
S. Hongo, T. Urano and T. Kanaji 143

Chemisorption of hydrogen on Cr(111) studied by XPS, UPS, and HREELS
Y. Fukuda and M. Nagoshi 147

Water adsorption kinetics on Si(111)-7 × 7: defect generation mechanism
V.A. Ukraintsev, B.S. Podolsky and A.A. Chernov 151

Nucleation of gold on Ca^{2+}-doped NaCl
A.D. Gates and J.L. Robins 154

Structural characterization of ultra-thin metal overlayers on Cu(001) by atom beam scattering
W. Li, J.-S. Lin, M. Karimi, C. Moses and G. Vidali 160

Direct imaging of thin film atomic structure by angular distribution Auger microscopy (ADAM)
D.G. Frank, T. Golden, O.M.R. Chyan and A.T. Hubbard 166

INTERFACE STUDIES

The effect of electronic excitation produced by an electron shower on the adhesion of copper films deposited on stainless steel
H. Yumoto, K. Watanabe, K. Akashi and N. Igata 173

Surface composition analysis of HF vapour cleaned silicon by X-ray photoelectron spectroscopy
A. Ermolieff, F. Martin, A. Amouroux, S. Marthon and J.F.M. Westendorp 178

Dissolution process of silicon in an indium solution
M. Kimura, A. Tanaka and T. Sukegawa 185

MEED studies of thin metal film covered semiconductor surfaces
G. Shimaoka 190

Effective temperature of products in laser evaporation and desorption
V.A. Ukraintsev, A.A. Chernov, A.N. Mezhuyev and B.S. Podolsky 198

Interface characterization of ZnSe/GaAs heterojunctions
T. Hariu, S. Yamauchi, H. Tanaka and S. Ono 204

Interface structure and Schottky barriers of epitaxial Pb on Si(111)
T. Hibma, H.H. Weitering, D.R. Heslinga and T.M. Klapwijk 209

SURFACE AND INTERFACE CHARACTERIZATION

Profiling of carbon, oxygen and argon contamination in sputter-deposited films using nuclear backscattering and nuclear reaction spectroscopy
A. Chevarier, N. Chevarier, M. El Bouanani, E. Gerlic, M. Stern, B. Roux and F. Thimon 215

Kretschmann ATR-IR spectroscopy of investigating metal/liquid(or solid) interfaces
A. Hatta, Y. Suzuki, T. Wadayama and W. Suëtaka 222

Study of interface structure of the oxide grown on nickel alloys by AP-FIM
D.G. Ren 227

Raman studies on GaAs epitaxial films on Si
Y. Matsuda, K. Fujita and S. Hinotani 231

A pressure contact current–voltage technique for rapid characterization of thin dielectric films
P.C. Karulkar, R.J. Hillard, J.M. Heddleson and P. Rai-Choudhury 237

LEIS for structure determination of surfaces and thin films
B.V. King, D.J. O'Connor, Y. Shen, R.J. MacDonald, M. Katayama and M. Aono 246

Cavity-enhanced photothermal spectroscopy and detection
H.A. Schuessler, S.H. Chen, Z.C. Tang and Z. Rong 254

Cavity-enhanced detection of surface ablation
E.C. Benck, Z. Rong, S.H. Chen and H.A. Schuessler 257

ELECTRONIC PROPERTIES OF THIN FILMS AND SURFACES

Metal-induced states on the GaAs(110) surface probed by angle-resolved photoemission spectroscopy
D. Heskett, D. Tang, A.B. McLean, R. Ludeke, M. Prietsch, T. Maeda Wong, E.W. Plummer and N.J. DiNardo 260

Ion beam modification of the dielectric properties of thin silicon dioxide films
S. Kar, A. Raychaudhuri, A.K. Sinha and S. Ashok 264

Crystallinity and electrical properties of tin-doped indium oxide films deposited by DC magnetron sputtering
Y. Shigesato, S. Takaki and T. Haranou 269

Mechanism of photoconduction on surface-oxidized Ge films
K. Oishi, K. Fukuchi, T. Suzuki and J. Sunada 276

On the microstructure, composition and electrical properties of Al/TiW/poly-Si system
S. Berger, Y. Komem and B.Z. Weiss 281

Electrical and optical properties of aluminum-doped amorphous silicon carbide films
P.K. Banerjee, J.S. Kim and S.S. Mitra 288

The dependence of the polycrystalline structure and electroluminescent properties of ZnS:Mn deposited on Y_2O_3 films on thickness
Y. Nakanishi, Y. Fukuda, Y. Hatanaka and G. Shimaoka 297

In situ electron spectroscopy on polymeric films prepared by RF plasma polymerization: styrene and hydrogen/styrene gas mixtures as process gases
S. Schelz, J. Eitle, R. Steiner and P. Oelhafen 301

Electrical and structural characterization of Co and Ni silicide contacts to silicon
A.K. Kulkarni and A.J. Canale 307

Investigation of the electronic structure of thin diamond films by photoelectron spectroscopy
A. Mansour, G. Indlekofer and P. Oelhafen 312

Novel diagrammatic method for analyzing the surface electronic modes of finite multilayer structures
G. Vecris and J.J. Quinn 319

Synchrotron radiation induced surface photovoltage at metal/GaAs interfaces
D. Mao, A. Kahn, M. Marsi and G. Margaritondo 324

A soft X-ray study of a Li–S surface compound
M.L. Shek, T.K. Sham, J. Hrbek and G.-Q. Xu 332

Anomalous inductive effect in Se–metal contacts
C.H. Champness and W.R. Clark 337

THIN FILM STRUCTURE AND PROPERTIES

Highly conductive TiO_2 thin films prepared by EB-modification
E. Gofuku, Y. Toyoda, Y. Uehara, M. Kohara and M. Nunoshita 343

Evidence for vertical C_2 on Ni as a precursor for graphite nucleation
D.E. Ramaker 351

The structure of Ge_xSi_{1-x}/Si strained layer superlattices and heterostructures
Zhang Rong, Zheng Youdou, Jiang Ruolian, Hu Liqun, Zhong Peixin, Yu Shidong, Li Qi, Feng Duan and Chen Guangxi 356

ISS–AES study of the initial growth stage of Cu thin films on Si(111)-7 × 7
I. Katayama, T. Hanawa, F. Shoji and K. Oura 361

Substrate temperature effects on $(\sqrt{3} \times \sqrt{3})$R30° domain growth of Ag on Si(111) surface
J.-K. Zuo and J.F. Wendelken 366

Sputter-deposition by a new Penning-discharge source with an axially integrated hot-cathode
F. Shoji, A. Ogawa and K. Oura 373

SEMICONDUCTOR THIN FILMS

Si–Ge alloys: growth, properties and applications
M. Arienzo, S.S. Iyer, B.S. Meyerson, G.L. Patton and J.M.C. Stork 377

Relationship between mechanical, electronic and vibrational properties of Ge_xSi_{1-x} strained layers
S.C. Jain, A. Atkinson and W.S. Khokle 387

Electron transport in hydrogenated amorphous silicon quantum wells
Y.L. Jiang and H.L. Hwang 392

Formation of silicon dioxide films in acidic solutions
A. Hishinuma, T. Goda, M. Kitaoka, S. Hayashi and H. Kawahara 405

In situ IR observation of photo-chemically deposited silicon nitride thin films
T. Wadayama, T. Hihara, A. Hatta and W. Suëtaka 409

Ultrathin Si films grown epitaxially on porous silicon
T. Yasumatsu, T. Ito, H. Nishizawa and A. Hiraki 414

Soft X-ray photoemission investigation of the $CdS/CuInSe_2$ heterojunction interface
A.J. Nelson, S. Gebhard, L.L. Kazmerski, A. Rockett, E. Colavita, M. Engelhardt and H. Höchst 419

HIGH T_c SUPERCONDUCTOR THIN FILMS

Surface characterization of Bi-based high-T_c superconducting thin films and bulk single crystals
H. Tokutaka and S. Kishida 425

A high-T_c SQUID for measuring susceptibility of high-T_c superconductive thin films
J.W. Qiu, L.W. Zhou, X.F. Zhang, Z.M. Tang, Y.J. Qian and Z.Y. Hua 430

Neutron depolarization study of a high-T_c epitaxial thin film
S.J. Pickart, M.L. Crow, A.C. Nunes, T.R. McGuire and A. Gupta 436

THIN FILM APPLICATIONS

MOCVD of TlBaCaCuO superconducting thin films: structure–property–processing relationships
N. Hamaguchi, R. Gardiner and P.S. Kirlin 441

Preparation conditions of flat 80 K phase Bi–Sr–Ca–Cu–O thin films by RF magnetron sputtering
S. Kishida, H. Tokutaka, H. Higashi, K. Nishimori and N. Ishihara 446

Surface study of single-crystal 80 K Bi–Sr–Ca–Cu–O superconductor with Si and Nb by RHEED and XPS depth profile
K. Nishimori, H. Tokutaka, T. Tamon, S. Kishida and N. Ishihara 450

Characterization of the surface of high-T_c Y–Ba–Cu–O
H. Kezuka and T. Masaki 454

Heterostructures with hydrogenated amorphous silicon for use in imaging devices
Y. Hatanaka 457

Secondary electron yield of SiO_2 and Si_3N_4 thin films for continuous dynode electron multipliers
J.J. Fijol, A.M. Then, G.W. Tasker and R.J. Soave 464

The current transport mechanism of p-type a-Si:H/n-type c-Si heterojunctions and their application to an imaging device
H. Mimura and Y. Hatanaka 472

ESR studies on luminescent ZnS:Mn films and CdS–ZnS:Mn superlattices deposited on a GaAs(100) substrate by hot-wall epitaxy
T. Nakamura, Y. Takeuchi, H. Muramatsu, H. Fujiyasu and Y. Nakanishi 478

Plasma–surface interactions of graphite as nuclear fusion material
T. Yamashina and T. Hino 483

New approach for a computer simulation of the vacuum deposition process
Y. Sasajima, Y. Suzuki, M. Takeuchi and S. Ozawa 498

Effects of impurities in a two-layer evaporated Au film on its tensile fracture
T. Hosaka 502

Violent oxidation of lithium-containing aluminum alloys in liquid oxygen
I. Dalins, M. Karimi and D. Ila 509

Copper-phthalocyanine thin film photoelectrochemical cells
M. Takeuchi, M. Masui and Y. Momose 517

A two-dimensional image sensor with a-Si:H pin diodes
H. Mimura, K. Sai, Y. Ohta, K. Yamamoto and K. Kitamura 521

Gas-sensitive properties of ultrafine In_2O_3 particle layers prepared by gas evaporation technique
M. Takeuchi, Y. Watanabe and S. Ozawa 526

Preparation and characterisation of nearly stoichiometric CdTe films from a non-aqueous electrodeposition bath
R.B. Gore, R.K. Pandey and S.R. Kumar 530

Single-crystal transformation of sphalerite CdS to cubic phase Cu_xS
C. Feldman, G. Deutscher and E. Grünbaum 535

Surface effects in reactive ion plating
D.M. Mattox 540

Optical, electrical and mechanical properties of RF-sputtered TiN–W–Au films
J.S. Kim, P.K. Banerjee, S.S. Mitra, H. Shastry, J.J. Loferski and R. Beaulieu 548

Sputtered TiN thin films for improved corrosion resistance
P. Bhardwaj, O.J. Gregory, K. Bragga and M.H. Richman 555

Capacitance characteristics of mixed monolayers of chlorophyll *a* and carotenoid canthaxanthin
A. Diarra, S. Hotchandani, H. Kassi and R.M. Leblanc 567

Spread films of single molecular transition-metal sulphides
W.M.R. Divigalpitiya, R.F. Frindt and S.R. Morrison 572

Author index 576

Subject index 582